Topeka News

Storm Spotter Edition

Volume 3, Issue 1 February, 2009

Special points of interest:

- 2009 Spotter Talk Schedule, and link for more information provided
- Handy card for severe weather reporting
- The challenges of nighttime spotting highlighted
- Severe weather products defined.

Inside this issue:

A Note from Warning Coordination Meteorologist Jennifer Stark

The 2008 severe weather season was another record breaking year in Kansas. The National Weather Service counted 187 tornadoes in 2008. This total shatters the previous record of 141 tornadoes set in 2007. If you consider that the average number of tornadoes from that last 20 years is 92, the 2008 number is staggering. Ninety-seven percent of the tornadoes in 2008 were weak, with 125 tornadoes rated EF0 and 38 tornadoes rated EF1, and no EF5 tornadoes in 2008. There were 4 tornado related fatalities and 9 injuries in Kansas.

Storm spotters and weather observers play a critical role in the warning process. Tools such as Doppler radar, weather satellites and computer models will never replace the ground truth information provided by storm spotters. A real time report adds a lot of weight and credibility to the wording of a severe weather warning from the NWS. The reports are immediately relayed to media, law enforcement and emergency management. Thank you for your commitment to aid the NWS in getting accurate warnings to the public.

In an effort to reduce mailing and printing costs, we ask NWS storm spotters to provide an email address to Jennifer.Stark@noaa.gov. Safety is always the number one priority of storm spotters. To report severe weather call 1-800-432-3929.

Important Spotter Training Information!

Current storm spotters, and any resident of northeast Kansas who aspires to be a storm spotter, are encouraged to attend a spotter training class each spring presented by meteorologists from the National Weather Service in Topeka. This year, presentations will be broken down into two sections. The first will take approximately one hour and feature a 2008 severe weather review, severe weather definitions and safety, ways to receive warnings, thunderstorm basics, spotting basics, and specifics regarding what to report and to whom. A brief intermission will follow. The second (optional) section will take approximately half of an hour, and will take a more in-depth look at spotting, and feature more real-world examples. Topics will include detailed supercell and tornado concepts, and spotting difficulties. We hope all seasoned spotters are able to attend a talk, and that several new faces will also drop-in. For a listing of all the spotter talks held in the NWS-Topeka forecast area, please visit **http://www.crh.noaa.gov/top/?n=talks** A list is also available on Page 6 of this newsletter.

Severe Weather Product Definitions

Hazardous Weather Outlook: Outlines any potential weather hazards for the next 7 days. The product is updated at least once each day around 5am, but may also be updated at any time as additional information becomes available. This product is to be used for planning purposes.

SPC Convective Outlook: A categorical forecast that specifies the perceived threat for severe weather across the United States for a given day. The Day 1 forecast is the most detailed, and separates out the probability for different severe weather hazards.

Severe Thunderstorm Watch: Issued by the Storm Prediction Center when severe thunderstorms are possible across the watch area. A severe thunderstorm features hail > 1" in diameter, wind speeds > 57mph, and can produce tornadoes. Watches are usually in effect for 6 hours or less.

Tornado Watch: Issued by the Storm Prediction Center when severe thunderstorms that have the capability to produce tornadoes are expected. Typically, wind shear is more favorable for rotating storms when a tornado watch is issued than for a severe thunderstorm watch. Watches are usually in effect for 6 hours or less.

Flash Flood Watch: Issued when flash flooding is possible, usually as the result of very heavy rainfall in a short period of time—typically when the ground is already nearly saturated.

Severe Thunderstorm Warning: Issued by the local forecast office when a thunderstorm is expected to produce hail greater than or equal to 1" in diameter, or wind gusts greater than 57mph usually based on radar data. A severe thunderstorm warning is usually in effect for less than an hour.

Tornado Warning: Issued by the local forecast office when a thunderstorm is expected to produce a tornado based on radar detected rotation or if trained storm spotters report a tornado. A warning may also be issued if storm spotters call in a report of low level rotation. A tornado warning is usually in effect for less than an hour.

Flash Flood Warning: Issued by the local forecast office when a rapid rise in small creeks or streams is expected as a result of heavy rainfall. Street flooding, both in urban and rural areas, is also possible.

Reporting Severe Weather

The handy Storm Spotter Guide to Reporting Severe Weather **(at right)** is the perfect size to keep in a wallet, purse, or pocket. Cut along the heavy dotted line around the card, then fold down the middle along the dashed line in the center. Tape together the three sides of the card for a business card sized guide to assist you with storm reporting! Laminate to give the card for even more strength.

All of the products listed above are available 24 hours a day at the NWS-Topeka homepage. Visit

www.weather.gov/topeka

for all the latest severe weather information including text and graphical products, current radar imagery, discussions, and even write-ups of past severe weather events.

NWS-Topeka Storm Spotters

Hazards to Report

Funnel Clouds: Any event
Tornadoes: Any event, and any damage as a result of a tornado
Hail: Every size should be reported, especially if > 0.75" (dime size)
Strong Winds: Any speed >50mph, any damage as a result of wind
Heavy Rainfall: Amounts >1" per hour or flash flooding
Total Snowfall: Accumulated amounts > 1"
Dense Fog: Visibilities < ½" mile

Call **1-800-432-3929** to report severe weather

Visit **www.weather.gov/topeka** for the latest severe weather information

When Submitting a Report:

1. State your name and Spotter ID
2. State your location, and the location of the weather event
3. State the time the event occurred and any known damage

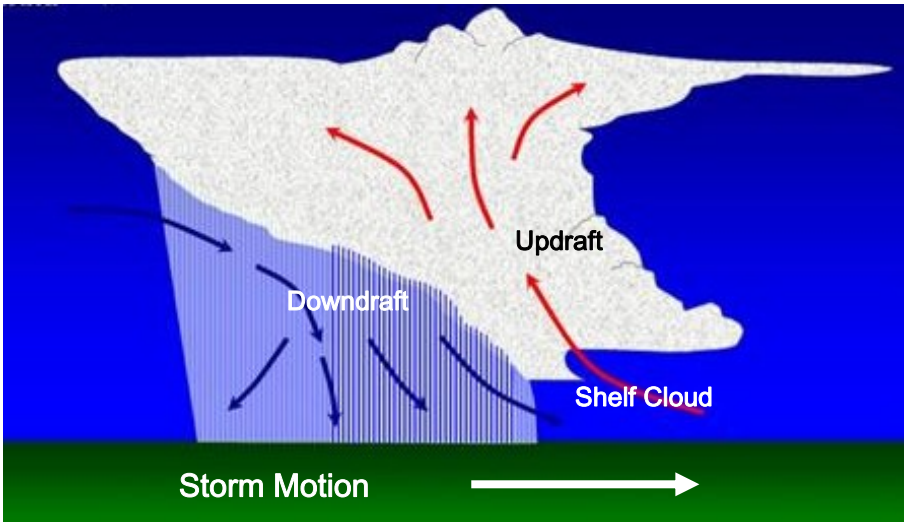
Estimating Wind Speed

- 50-57mph: Small branches or limbs < 2" diameter broken off
- 58-69mph: Large limbs 2-4" diameter down, power lines down
- 70-80mph: Small trees uprooted, limbs >4" down, shingles torn off
- > 80 mph: Large trees uprooted, power poles snapped

Hail Size

A storm spotter for the NWS-Topeka Forecast Office should take note of and report hail greater than 3/4" in diameter, winds stronger than 57mph, any of the storm features outlined in the squall line or supercell thunderstorm sections below, and any damage caused by severe weather. These reports assist in the local warning process. For more complete training, please attend a local storm spotter class this year! A web link is available on Page 1, and schedule on Page 6 of this newsletter.

Squall Line Features



The updraft/downdraft interface is the focus for severe weather development. A **shelf cloud** is the visual clue that denotes the location of the updraft/downdraft interface. Strong, gusty winds and small hail are the most likely severe weather events with squall lines. Tornadoes are possible along the leading edge, but infrequent.

Supercell Thunderstorm Features

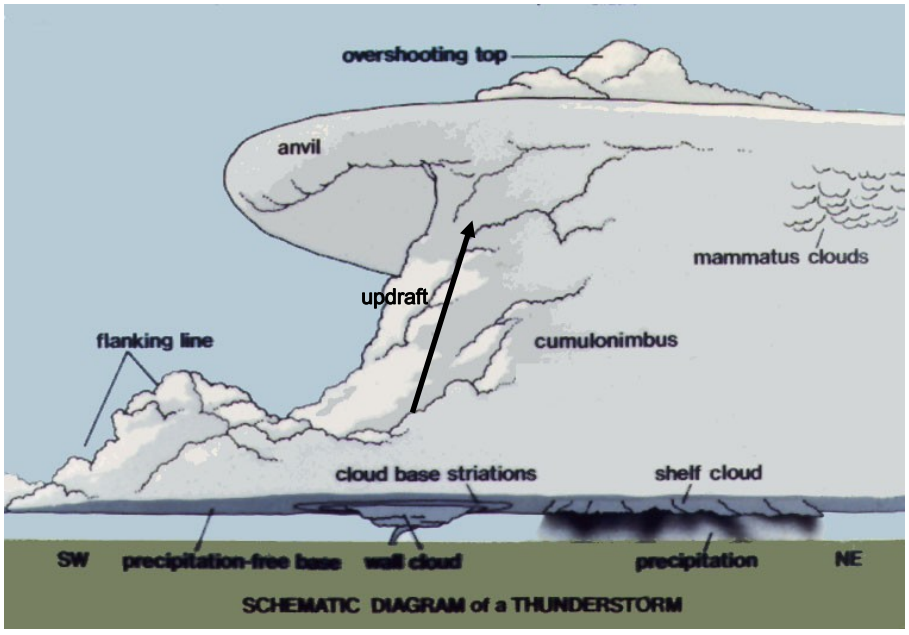
The best location to view the features of a supercell thunderstorm is typically (but not always) to the southeast of the storm updraft. It's best to stay 2-4 miles from the storm to maintain a safe spotting distance, but still be able to resolve the thunderstorm features.

Tornado: Violently rotating column of air extending from the base of a thunderstorm.

Funnel Cloud: Rotating funnel shaped column of air extending from the base of a cloud that is not in contact with the ground.

Wall Cloud: A localized—typically 1-3 miles across—lowering from the base of a thunderstorm. This feature may be rotating or not.

Rain-Free Base: Dark, horizontal rain-free base of a thunderstorm. This is usually the location of the thunderstorm updraft.



Downdraft: Outward burst of damaging winds at or near the ground. Strong winds and large hail are also possible. Remember, ragged **Scud** **Clouds** do not rotate and are not indicative of severe weather !

The Challenges of Nighttime Spotting by Scott F. Blair, General Forecaster

Nighttime storm spotting can contain some of the most difficult and dangerous tasks involved in observing storms. It is strongly recommended that individuals have an advanced knowledge of storm structure and behavior before attempting to look at storms in the dark. If a storm spotter lacks experience when observing storms during the daytime, then nighttime observing should not be attempted. The following is applicable to both stationary and mobile storm observers. **Safety should always be the number one priority for any storm spotter, and a safe shelter should be sought at any time dangerous weather is approaching or the situation feels unsafe.** While time of day is generally irrelevant to storm behavior, a spotter's behavior should change at twilight. Here are a few tips to assist keeping you safe at night. **1)** After sunset, rapid changes in a storm's evolution are much harder to see than during the daytime. Reaction time and "room for error" significantly decrease. Providing a larger buffer zone between you, the spotter, and the storm is a must. For example, satellite tornadoes can form well away from the parent tornado. As such, these can be a significant threat to an observer at even a modest distance from the main tornado, especially in the dark. **2)** Clearly know your position relative to a tornado (whether Doppler-indicated or visually-confirmed). If a tornado is expected to approach your location, do NOT attempt to look for it as the storm nears. **3)** Lightning flashes are typically the primary source for illuminating storm features at night. But, ample amounts of lightning are never guaranteed. Sometimes, low-topped tornadic storms produce only a meager amount of lightning on the order of a couple flashes per hour! When sufficient lightning is present within a storm, it can be used to "backlight" the area of interest. A good concentration of lightning is usually found within the downdraft region and near the updraft's vault. By positioning *behind* the storm's predominant movement (i.e. to the southwest of a northeast-moving storm), one can utilize lightning to backlight the updraft and low-level base of a storm. This also places the observer in a safer position as the storm moves away from the individual, as long as no other storms are approaching. **4)** On rare occasions, the glow of city lights can help illuminate the low-levels of a storm. This can be beneficial for studying low-level storm features for longer periods of time than lightning flashes provide. Also, power flashes underneath a storm's base may signify areas where wind damage is occurring. It's important to remember that the presence of power flashes does not equate to the existence of a tornado. Straight-line winds from the rear-flank downdraft can reach over 100 mph and result in concentrated areas of wind damage. Report power flashes related to severe weather, but be careful to convey any uncertainty. **5)** Remain aware of abrupt wind direction or speed changes to keep good situational awareness. Surface winds will respond to strong updrafts—especially modest low-level rotation. Understanding one's position relative to the storm makes it possible to deduce the origin or response of a sudden wind shift/gust. For instance, if the prevailing wind direction has been from the south and winds abruptly increase from the northeast as an updraft approaches, this is a signal that the low-level winds have been augmented as inflow goes into the storm. **6)** Flash flooding gives very few warning signs in the dark. Be aware of posted low-water crossings and areas that have experienced very heavy rain, even if precipitation has ended. If one encounters a flooded roadway, turn around and find an alternative route. Hail-covered roadways and downed power poles and tree limbs can also result in very dangerous conditions and hydroplaning. Remember to be watchful for these hazards and reduce driving speeds when entering areas where storms have recently departed. **7)** Supplemental weather information from NOAA All-Hazards Radio, television, or radar imagery, can greatly assist in safe nighttime storm spotting.

Have several methods for obtaining severe weather information in case communication is compromised due to severe weather. Keep in mind that radar imagery may be several minutes old, so do not solely rely on radar to make critical spotting decisions. **8)** Lastly, when spotting storms at night, remain patient and vigilant to observations. It may be easy to jump to incorrect conclusions when little light is available. What may appear as a tornado could just as easily be low-level scud clouds or a distant telephone pole. **Careful observations over a couple minutes typically allow spotters to 'put the pieces together' by using the existing environmental clues.** A storm spotter should never let their guard down in the presence of severe weather, especially at night.

Following these general nighttime storm spotting tips, and keeping current with a healthy understanding of storm spotter techniques and storm behavior, should assist in keeping everyone safe.

A tornado is illuminated by a brilliant flash of lightning. The tornado was located northeast of the storm spotter, moving away from the observer. Photo copyright 2007 Amos Magliocco, used with permission.

The May 29th 2008 Storm Chase by Bill Gargan, Lead Forecaster

My wife Nancy and I observed a rain-wrapped supercell thunderstorm in west central Nebraska during the late afternoon of May 29th that tracked east along I-80 into the east central part of the state. We began northeast of the updraft but quickly lost interest in this outflow dominate storm. I knew another blob of convection was developing across northwest Kansas. I assumed this storm was also outflow dominate because the vertical wind shear in Kansas was forecast to be even weaker than in the environment across central Nebraska. We battled to head south of the HP (High Precipitation) supercell but had no cell phone connection in rural Nebraska, and thus had no radar data to download. We broke south of I-80 at York, NE and Nancy was somehow able to download a radar image to her Blackberry. She showed it to me, and I was surprised to see that the radar reflectivity depicted a classic supercell with a nice hook echo. I told her that this supercell probably had been producing classic tornadoes for quite some time in central Kansas and that it was now the new target storm. Unfortunately, the sun was setting as we drove south to the Kansas border. It was dark by the time we made it into northern Republic County on US Highway 81. Nancy still periodically downloaded radar data to her Blackberry. The storm reflectivity maintained the classic supercell look and featured a nice inflow notch on the southeast side of the storm and a hook appendage on the southwest side of the updraft. I extrapolated the storm's movement based on warning reports we heard from the local radio station in Belleville. I deduced the storm was going to move northeast across eastern Jewell County into southwest Republic County within the next 45 minutes. We headed south of Belleville on US Highway 81, then west on State Highway 148. We totally lost cell phone connection at that point and were again left without access to radar data and were unsure if the storm had morphed into an HP supercell. We approached the Republic/Jewell County border, and I began to see a line of stratus—and again thought that the storm had become outflow dominant. We could see a lot of lightning to the north-northwest and knew that the storm was moving faster than my forecasted trajectory. We therefore turned around and headed east to a paved county road that went north towards Courtland to get in place to observe the storm, but also remain safe. Chasing an HP supercell at night would be incredibly dangerous, and even with years of observing experience opted not to take any chances and maintain a long distance from the storm. We looked northwestward and began to see the updraft base and a wall cloud illuminated by the lightning. There were no visible rain curtains around the updraft. I knew that we were now following a classic supercell thunderstorm. We drove northward a few more miles, and lightning began to illuminate a large cone shape. At first, we thought we may have been looking at a large wall cloud. We were mistaken though, and realized the lightning illuminated a one quarter mile wide tornado! We could see the debris cloud and therefore knew it was a tornado. We headed east on a county road south of Scandia, while the large tornado tracked east-northeast across west central Republic County. I attempted to call the National Weather Service in Topeka, but was unfortunately still out of cell phone range. But, the local radio station was broadcasting that spotters reported a large tornado, so we knew the information had reached the NWS. We stayed ahead of the storm producing the large tornado as we drove east, to the north of Bellville. We turned northward onto US Highway 81. The tornado was in sight to our northwest, albeit sporadically since it was nighttime. The tornado crossed the road a distance from us. The supercell thunderstorm updraft occluded right in front of us. A new wall cloud formed on the east side of US Highway 81 around five miles north of Bellville. The large tornado continued to track eastward, and a second tornado formed under the new wall cloud. Ample lightning flashes northeast of both updrafts offered perfect back-lighting to see both tornadoes. The second tornado grew wider as it moved off to the northeast, away from our location. The original tornado began to dissipate as it moved across the highway. Once the original, now occluded tornado and moved east of the highway away from our path, we continued north. We watched as the second tornado grew to about one quarter mile wide. The first tornado dissipated, but did not rope out. We traveled north a few more miles, but lost the view of the second tornado to our east. We tried to look for a way to travel east while staying south of the thunderstorm core, but most roadways were filled with mud. We decided it was not worth getting stuck in the mud on one of the county dirt roads. The radio broadcasted reports of strong damaging winds associated with a squall line about 30 miles west of what had been our location, which was moving east. At that point, we decided to drop south and east on our way back home to Topeka to stay away from the potentially damaging winds. I was relieved to hear there were no serious injuries or fatalities with this storm. The NWS-Topeka issued several tornado warnings for this dangerous tornadic supercell. This was the most satisfying night time storm chase I'd experienced since my first storm chase in the plains on March 26, 1991 in north central Oklahoma.

One of the tornadoes that occurred before nightfall. Photo copyright 2008 Scott Blair, used with permission.

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Phone: 785-234-2592
Spotter Hotline: 1-800-432-3929
E-mail:
w-top.webmaster@noaa.gov

Topeka News

2009 Spotter Talks by County (City in Parenthesis)

All Spotter Talks begin at 7:00pm. Additional talks may be added, so please check the web (see Page 1 for address) for the most up-to-date list.

February

19: **Anderson** (Garnett—North Park Community Building, North Lake Road)
19: **Pottawatomie** (St. Mary's–Fire Station, 404 West Lasley)
23: **Wabaunsee** (Alma—Wabaunsee High School, 912 Missouri St.)
25: **Nemaha** (Sabetha—Community Center, 1116 Main St.)
25: **Republic** (Belleville—4H Building Fairgrounds, 901 O Street)
26: **Jefferson** (Grantville—Community Building, 3877 South St.)

March

2: **Geary** (Junction City—4H Senior Center, 1025 S. Spring Valley Rd)
2: **Dickinson** (Herington—Hilltop Building 2, South A Street)
3: **Jackson** (Holton—Senior Citizens Building, 312 Pennsylvania)
5: **Jefferson** (Ozawkie—Ozawkie Township Hall, 524 Kiowa)
9: **Shawnee** (Topeka—Washburn University Memorial Union)
10: **Lyon** (Emporia—Anderson Building Fairgrounds)
10: **Clay** (Clay Center—Baptist Church Meeting Hall, 5th and Dexter)
11: **Cloud** (Concordia—Cook Theater, Community College)
12: **Nemaha** (Seneca—Community Building, 1500 Community Dr.)
12: **Franklin** (Ottawa—Celebration Hall, 1701 S. Elm)
16: **Shawnee** (Topeka—Mission Township Fire Dept, 53rd & Wana maker)
17: **Washington** (Washington—Emergency Services Building, 900 D Street)
17: **Dickinson** (Abilene—Rec Center, NW 8th & Poplar)
18: **Pottawatomie** (Westmoreland—Fire Station, 305 S. 6th St.)
19: **Riley** (Manhattan— Pottorf Hall @ Riley Cty Fairgrounds, Avery Ave. and Robinson Dr.)
23: **Morris** (Council Grove— Courthouse, 501 W. Main)
23: **Osage** (Lyndon— High School Auditorium, 421 E. 6th St.)
24: **Lyon** (Olpe—Knights of Columbus, 212 Iowa St)
25: **Brown** (Hiawatha—Fisher Community Center, 201 E. Iowa St)
26: **Douglas** (Lawrence—Arts Center, 940 New Hampshire St.)
30: **Ottawa** (Minneapolis—Courthouse Basement, 307 N. Concord St.)
31: **Coffey** (New Strawn—ACCC Healthcare Academy, 139 N. 1st Terrace)
31: **Marshall** (Marysville—Helvering Community Center, 111 South 8th St)